Appl. No. 10/826534

In the Claims:

Listing of all claims:

1. (Previously Presented) A welding type power source capable of receiving a range of input voltages and frequencies, comprising:

an input circuit configured to receive an input power signal having an input frequency and an input magnitude and provide a first signal having a magnitude responsive to the input magnitude;

a preregulator configured to receive the first signal and provide a dc second signal having a preregulator magnitude independent of the input magnitude;

an output circuit configured to receive the dc second signal and provide a welding type output power signal having an output frequency independent of the input frequency and having an output voltage independent of the input voltage;

a preregulator controller, connected to the preregulator, having a power factor correction circuit, and further having a controller power input; and

a control power circuit configured to receive the dc second signal and provide a control power signal to the controller power input, wherein the controller power signal has a control power magnitude independent of the input magnitude and a control frequency independent of the input frequency.

2. (Original) The apparatus of claim 1, wherein the input circuit includes a rectifier.

3. (Original) The apparatus of claim 1, wherein the preregulator magnitude is greater than the first magnitude.

4. (Original) The apparatus of claim 3, wherein the preregulator includes a boost converter.

5. (Original) The apparatus of claim 4, wherein the boost converter includes a slow voltage switched switch and a slow current switched switch.

6. (Original) The apparatus of claim 3, wherein the output circuit includes an inverter.

7. (Original) The apparatus of claim 3 wherein the output circuit includes a switched snubber.

8. (Original) The apparatus of claim 3, wherein the preregulator magnitude is greater than the control power magnitude.

9. (Original) The apparatus of claim 3 wherein the control power circuit includes a buck converter.

10. (Cancelled.)

11. (Previously Presented) A method of providing welding type power from a range of input voltages and frequencies, comprising:

receiving an input power signal having an input frequency and an input magnitude;

providing a first signal having a magnitude responsive to the input magnitude;

converting and power factor correcting, by controlling a switch, the first signal into a dc second signal having a second magnitude independent of the input magnitude;

providing an output power signal derived from the dc second signal, wherein the output power signal is a welding type output and has an output frequency independent of the input frequency and further has an output voltage independent of the input voltage; and

converting the dc second signal into control power, wherein the control power has a control power magnitude independent of the input magnitude.

12. (Original) The method of claim 11, wherein providing a first signal includes rectifying an ac signal.

13. (Original) The method of claim 11, wherein the second magnitude is greater than the first magnitude.

14. (Original) The method of claim 13, wherein converting the first signal into a dc second signal includes boost converting the first signal.

15. (Original) The method of claim 13, wherein boost converting the first signal includes a slow voltage switching and slow current switching a switch.

16. (Original) The method of claim 13, wherein providing an output power signal includes inverting the dc second signal.

17. (Original) The method of claim 13 wherein inverting the dc second signal includes switching a snubber.

18. (Original) The method of claim 13, wherein the second magnitude is greater than the control power magnitude.

19. (Original) The method of claim 13 wherein converting the dc second signal into control power includes buck converting the dc second signal.

20. (Cancelled.)

21. (Previously Presented) A welding type power source capable of receiving a range of input voltages and frequencies, comprising:

input means for receiving an input power signal having an input frequency and an input magnitude and for providing a first signal having a magnitude responsive to the input magnitude;

converting means for converting, and power factor correcting by controlling a switch, the first signal into a dc second signal having a magnitude independent of the input magnitude, wherein the converting means is connected to receive the first signal;

means for providing a welding type output power signal derived from the dc second signal, wherein the output power signal and has an output frequency independent of the input frequency and further has an output voltage independent of the input voltage, and wherein the means for providing an output power signal is disposed to receive the dc second signal;

means for converting the dc second signal into control power, wherein the control power has a control power magnitude independent of the input magnitude.

22. (Original) The apparatus of claim 21, wherein the first means includes means for rectifying an ac signal.

23. (Original) The apparatus of claim 22, wherein the convertor magnitude is greater than the first magnitude.

24. (Original) The apparatus of claim 23, wherein the converting means includes means for boost converting the first signal.

25. (Original) The apparatus of claim 24, wherein the means for boost converting includes means for slow voltage switching and slow current switching a switch.

26. (Original) The apparatus of claim 25, wherein the means for providing an output power signal includes means for inverting the dc second signal.

27. (Original) The apparatus of claim 26 wherein the means for inverting includes means for switching a snubber.

28. (Original) The apparatus of claim 27, wherein the converter magnitude is greater than the control power magnitude.

Appl. No. 10/826534

29. (Original) The apparatus of claim 28 wherein the means for converting the dc second signal into control power includes means for buck converting the dc second signal.

30. (Previously Presented) A welding type power source capable of receiving a range of input voltages and frequencies, comprising:

a dc bus;

an output circuit configured, having a control input and to receive the dc bus and provide a welding type output power signal having an output frequency independent of the input frequency and having an output voltage independent of the input voltage;

a controller, including a power factor correction circuit, connected to the control input and further having a controller power input; and

a control power circuit configured to receive the dc bus and provide a control power signal to the controller power input.

31. (Original) The apparatus of claim 30, wherein the output circuit includes an inverter.

32. (Original) The apparatus of claim 31, wherein the output circuit includes a switched snubber.

33. (Original) The apparatus of claim 30, wherein the dc bus has a magnitude is greater than a magnitude of the control power signal.

34. (Original) The apparatus of claim 30 wherein the control power circuit includes a buck converter.

35-36. (Cancelled.)

37. (Previously Presented) A welding type power source capable of receiving a range of input voltages and frequencies, comprising:

an input circuit configured to receive an input power signal having an input frequency and an input magnitude and provide a first signal having a magnitude responsive to the input magnitude;

a preregulator configured to receive the first signal and provide a dc second signal having a preregulator magnitude independent of the input magnitude;

an output circuit configured to receive the dc second signal and provide a welding type output power signal having an output frequency independent of the input frequency and having an output voltage independent of the input voltage;

a preregulator controller, connected to the preregulator, and further having a controller power input; and

a control power circuit configured to receive the dc second signal and provide a control power signal to the controller power input, wherein the controller power signal has a control power magnitude independent of the input magnitude and a control frequency independent of the input frequency, without reconfiguring the control power circuit.

38. (Previously Presented) The apparatus of claim 37, wherein the input circuit includes a rectifier.

39. (Previously Presented) The apparatus of claim 37, wherein the preregulator magnitude is greater than the first magnitude.

40. (Previously Presented) The apparatus of claim 39, wherein the preregulator includes a boost converter.

41. (Previously Presented) The apparatus of claim 40, wherein the boost converter includes a slow voltage switched switch and a slow current switched switch.

42. (Previously Presented) The apparatus of claim 39, wherein the output circuit includes an inverter.

43. (Previously Presented) The apparatus of claim 39 wherein the output circuit includes a switched snubber.

44. (Previously Presented) The apparatus of claim 39, wherein the preregulator magnitude is greater than the control power magnitude.

45. (Previously Presented) The apparatus of claim 39 wherein the control power circuit includes a buck converter.

46. (Previously Presented) A method of providing welding type power from a range of input voltages and frequencies, comprising:

receiving an input power signal having an input frequency and an input magnitude;

providing a first signal having a magnitude responsive to the input magnitude;

converting the first signal into a dc second signal having a second magnitude independent of the input magnitude;

providing an output power signal derived from the dc second signal, wherein the output power signal is a welding type output and has an output frequency independent of the input frequency and further has an output voltage independent of the input voltage; and

converting the dc second signal into control power, without reconfiguring a control power circuit, wherein the control power has a control power magnitude independent of the input magnitude.

47. (Previously Presented) The method of claim 46, wherein providing a first signal includes rectifying an ac signal.

48. (Previously Presented) The method of claim 46, wherein the second magnitude is greater than the first magnitude.

49. (Previously Presented) The method of claim 48, wherein converting the first signal into a dc second signal includes boost converting the first signal.

50. (Previously Presented) The method of claim 48, wherein boost converting the first signal includes a slow voltage switching and slow current switching a switch.

51. (Previously Presented) The method of claim 48, wherein providing an output power signal includes inverting the dc second signal.

52. (Previously Presented) The method of claim 48, wherein inverting the dc second signal includes switching a snubber.

53. (Previously Presented) The method of claim 48, wherein the second magnitude is greater than the control power magnitude.

54. (Previously Presented) The method of claim 48, wherein converting the dc second signal into control power includes buck converting the dc second signal.

55. (Previously Presented) A welding type power source capable of receiving a range of input voltages and frequencies, comprising:

input means for receiving an input power signal having an input frequency and an input magnitude and for providing a first signal having a magnitude responsive to the input magnitude;

converting means for converting the first signal into a dc second signal having a magnitude independent of the input magnitude, wherein the converting means is connected to receive the first signal;

means for providing a welding type output power signal derived from the dc second signal, wherein the output power signal and has an output frequency independent of the input frequency and further has an output voltage independent of the input voltage, and

wherein the means for providing an output power signal is disposed to receive the dc second signal;

means for converting the dc second signal into control power, without reconfiguring, wherein the control power has a control power magnitude independent of the input magnitude.

56. (Previously Presented) The apparatus of claim 55, wherein the first means includes means for rectifying an ac signal.

57. (Previously Presented) The apparatus of claim 56, wherein the convertor magnitude is greater than the first magnitude.

58. (Previously Presented) The apparatus of claim 57, wherein the converting means includes means for boost converting the first signal.

59. (Previously Presented) The apparatus of claim 58, wherein the means for boost converting includes means for slow voltage switching and slow current switching a switch.

60. (Previously Presented) The apparatus of claim 59, wherein the means for providing an output power signal includes means for inverting the dc second signal.

61. (Previously Presented) The apparatus of claim 60, wherein the means for inverting includes means for switching a snubber.

62. (Previously Presented) The apparatus of claim 61, wherein the converter magnitude is greater than the control power magnitude.

63. (Previously Presented) The apparatus of claim 62 wherein the means for converting the dc second signal into control power includes means for buck converting the dc second signal.

64. (Previously Presented) A welding type power source capable of receiving a range of input voltages and frequencies, comprising:

an input circuit configured to receive an input power signal having an input frequency and an input magnitude and provide a first signal having a magnitude responsive to the input magnitude;

a preregulator configured to receive the first signal and provide a dc second signal having a preregulator magnitude independent of the input magnitude;

an output circuit configured to receive the dc second signal and provide a welding type output power signal having an output frequency independent of the input frequency and having an output voltage independent of the input voltage;

a preregulator controller, connected to the preregulator, and further having a controller power input;

a control power circuit configured to receive the dc second signal and provide a control power signal to the controller power input, wherein the controller power signal has a control power magnitude independent

of the input magnitude and a control frequency independent of the input frequency; and

an aux power circuit configured to receive the dc second signal and provide a synthetic AC aux signal having magnitude independent of the input magnitude and a frequency independent of the input frequency.

65. (Previously Presented) The apparatus of claim 64, wherein the input circuit includes a rectifier.

66. (Previously Presented) The apparatus of claim 64, wherein the preregulator magnitude is greater than the first magnitude.

67. (Previously Presented) The apparatus of claim 66, wherein the preregulator includes a boost converter.

68. (Previously Presented) The apparatus of claim 67, wherein the boost converter includes a slow voltage switched switch and a slow current switched switch.

69. (Previously Presented) The apparatus of claim 67, wherein the output circuit includes an inverter.

70. (Previously Presented) The apparatus of claim 67, wherein the output circuit includes a switched snubber.

71. (Previously Presented) The apparatus of claim 66, wherein the preregulator magnitude is greater than the control power magnitude.

72. (Previously Presented) The apparatus of claim 66 wherein the control power circuit includes a buck converter.

73. (Previously Presented) A method of providing welding type power from a range of input voltages and frequencies, comprising:

receiving an input power signal having an input frequency and an input magnitude;

providing a first signal having a magnitude responsive to the input magnitude;

converting the first signal into a dc second signal having a second magnitude independent of the input magnitude;

providing an output power signal derived from the dc second signal, wherein the output power signal is a welding type output and has an output frequency independent of the input frequency and further has an output voltage independent of the input voltage;

converting the dc second signal into control power, wherein the control power has a control power magnitude independent of the input magnitude; and

inverting the dc second signal into synthetic AC aux power, wherein the aux power has a control power magnitude independent of the input magnitude.

74. (Previously Presented) The method of claim 73, wherein providing a first signal includes rectifying an ac signal.

75. (Previously Presented) The method of claim 73, wherein the second magnitude is greater than the first magnitude.

76. (Previously Presented) The method of claim 75, wherein converting the first signal into a dc second signal includes boost converting the first signal.

77. (Previously Presented) The method of claim 75, wherein boost converting the first signal includes a slow voltage switching and slow current switching a switch.

78. (Previously Presented) The method of claim 75, wherein providing an output power signal includes inverting the dc second signal.

79. (Previously Presented) The method of claim 75, wherein inverting the dc second signal includes switching a snubber.

80. (Previously Presented) The method of claim 75, wherein the second magnitude is greater than the control power magnitude.

81. (Previously Presented) The method of claim 75, wherein converting the dc second signal into control power includes buck converting the dc second signal.

82. (Previously Presented) A method of providing welding type power from a range of input voltages and frequencies, comprising:

rectifying an input power signal having an input frequency and an input magnitude to provide a rectified signal having a rectified magnitude responsive to the input magnitude;

boost converting, including slow voltage switching and slow current switching, the rectified signal to provide a boost dc signal having a boost magnitude greater than and independent of the rectified input magnitude;

inverting, including switching a snubber, the dc second signal to provide a welding type power output having an output frequency independent of the input frequency and having an output voltage independent of the rectified magnitude;

converting the boost dc signal to provide a control power signal, wherein the control power signal has a control power magnitude less than and independent of the boost magnitude, and a control frequency independent of the input frequency; and

inverting the boost dc signal to provide a synthetic AC aux power signal, wherein the aux power signal has a magnitude less than and independent of the boost magnitude, and a frequency independent of the input frequency.

83. (Previously Presented) A welding type power source capable of receiving a range of input voltages and frequencies, comprising:

input means for receiving an input power signal having an input frequency and an input magnitude and for providing a first signal having a magnitude responsive to the input magnitude;

converting means for converting the first signal into a dc second signal having a magnitude independent of the input magnitude, wherein the converting means is connected to receive the first signal;

means for providing a welding type output power signal derived from the dc second signal, wherein the output power signal and has an output frequency independent of the input frequency and further has an output voltage independent of the input voltage, and wherein the means for providing an output power signal is disposed to receive the dc second signal;

means for converting the dc second signal into control power, wherein the control power has a control power magnitude independent of the input magnitude; and

means for inverting the dc second signal into synthetic AC aux power, wherein the aux power has a control power magnitude independent of the input magnitude.

84. (Previously Presented) The apparatus of claim 83, wherein the first means includes means for rectifying an ac signal.

85. (Previously Presented) The apparatus of claim 84, wherein the convertor magnitude is greater than the first magnitude.

86. (Previously Presented) The apparatus of claim 85, wherein the converting means includes means for boost converting the first signal.

87. (Previously Presented) The apparatus of claim 83 , wherein the means for boost converting includes means for slow voltage switching and slow current switching a switch.

88. (Previously Presented) The apparatus of claim 87, wherein the means for providing an output power signal includes means for inverting the dc second signal.

89. (Previously Presented) The apparatus of claim 88 wherein the means for inverting includes means for switching a snubber.

90. (Previously Presented) The apparatus of claim 89, wherein the converter magnitude is greater than the control power magnitude.

91. (Previously Presented) The apparatus of claim 90, wherein the means for converting the dc second signal into control power includes means for buck converting the dc second signal.

92. (Previously Presented) A welding type power source capable of receiving a range of input voltages and frequencies, comprising:

a dc bus;

an output circuit configured, having a control input and to receive the dc bus and provide a welding type output power signal having an output frequency independent of the input frequency and having an output voltage independent of the input voltage;

a controller, connected to the control input and further having a controller power input;

a control power circuit configured to receive the dc bus and provide a control power signal to the controller power input; and

an aux power circuit configured to invert the dc bus and provide synthetic AC aux power signal.

93. (Previously Presented) The apparatus of claim 92, wherein the output circuit includes an inverter.

94. (Previously Presented) The apparatus of claim 93, wherein the output circuit includes a switched snubber.

95. (Previously Presented) The apparatus of claim 92, wherein the dc bus has a magnitude is greater than a magnitude of the control power signal.

96. (Previously Presented) The apparatus of claim 92 wherein the control power circuit includes a buck converter.

97. (Previously Presented) A method of providing welding type power from a range of input voltages and frequencies, comprising:

receiving a dc bus having a dc magnitude;

providing an output power signal derived from the dc bus, wherein the output power signal is a welding type output; and

converting the dc bus into control power, wherein the control power has a control power magnitude independent of the dc magnitude;

providing the control power to a controller configured to control the output power; and

inverting the dc bus into synthetic AC aux power.

98. (Previously Presented) A method of starting to provide welding type power from a range of input voltages and frequencies, comprising:

receiving an input power signal having an input frequency and an input magnitude;

providing a first dc signal having a first dc magnitude responsive to the input magnitude;

deriving a second dc voltage having a second dc magnitude less than the first dc magnitude;

controlling a control converter with the second dc voltage to produce a control dc voltage;

controlling an output converter with the control dc voltage to produce an output signal; and

inverting the second dc voltage to produce a synthetic AC aux signal.